



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,991	01/21/2004	Wilfred Cadelina Jamison	RSW920030277US1	4291
36736	7590	12/18/2007		
DUKE W. YEE			EXAMINER	
YEE & ASSOCIATES, P.C.			VU, TUAN A	
P.O. BOX 802333				
DALLAS, TX 75380			ART UNIT	PAPER NUMBER
			2193	
			MAIL DATE	DELIVERY MODE
			12/18/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

AK

<b>Office Action Summary</b>	<b>Application No.</b> 10/761,991	<b>Applicant(s)</b> JAMISON, WILFRED CADELINA	
	<b>Examiner</b> Tuan A. Vu	<b>Art Unit</b> 2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3-8,10,12-17 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10,12-17 and 19-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This action is responsive to the Applicant's response filed 10/17/07.

As indicated in Applicant's response, claims 1, 10, 17 have been amended, and claims 2, 9, 11, 18 canceled. Claims 1, 3-8, 10, 12-17 and 19-23 are pending in the office action.

#### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 5-8, 10, 13-17, 19, 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Coha et al., USPubN: 2003/0182597– now issued as USPN: 6,804,691(hereinafter Coha).

As per claim 1, Coha discloses a method of improving performance in a Java computer application program executable by a Java Virtual Machine (e.g. Fig. 2A), comprising the steps of: obtaining information associated with garbage collection (e.g. Fig. 2A; para 0023-0031, pg. 2); and deducing changes in performance (e.g. Fig. 3; para 0040, pg. 3; Fig. 5; para 0069, pg.4; step 250 - Fig. 2B) that will result from modifying the Java computer application program;

wherein the cost of garbage collection to program performance of a modified version of the Java computer application program (e.g. Fig. 2A-B) is estimated by the computer-implemented method using a duration of an average garbage collection event and a frequency of

Art Unit: 2193

occurrence of particular garbage collection events (e.g. *duration* - para 0037, pg. 3; *intervals between* - para 0058-0059, 0063, pg. 4).

**As per claim 3**, Coho discloses wherein the cost of garbage collection is reduced by reducing either or both of the duration and frequency ( e.g. *how much time was spent* - para 0039-0040, pg. 3; para 0069, pg. 4; para 0075-0077 – Note: tuning parameters based on garbage collection time usage reads on optimizing code by alleviating time spent in garbage collection).

**As per claims 5-6**, Coho discloses wherein the frequency depends on the rate of object creation (e.g. *rate* - para 0038, pg. 3; para 0056, pg. 4; para 0047, pg. 3; para 0054, pg. 4), the heap fragmentation, the size of the heap ( para 0067-0068, pg. 4 – Note: heap usage and unreferenced data therein reads on amount of fragmentation of garbage collectable data and freeing– see para 0032, pg. 2), and the garbage collection policy ( para 0042,pg. 3); wherein the Java computer application program is changed (e.g. step 260, Fig. 2A) by reducing memory from a footprint (para 0064, pg. 4; Fig. 2A) of the Java computer application program.

**As per claim 7**, Coho discloses wherein given the amount of memory to be reduced from the footprint(Fig. 2A), a total duration for a run (Fig. 3-4), and how much of the run is spent in garbage collection ( para 0039, pg. 3; para 0059, pg. 4), the number of additional transactions that can be computed during the run is determined ( para 0050-0064, pg. 4; para 0023-0030, pg. 2).

**As per claim 8**, Coho discloses a *verbosegc* (para 0031, pg. 2).

**As per claim 10**, Coho discloses computer system capable of running a Java program by a Java Virtual Machine, comprising:

a garbage heap associated with garbage collection events, wherein garbage collection

Art Unit: 2193

events have an average duration and frequency (e.g. para 0037, pg. 3; para 0058-0059, 0063, pg. 4);

instructions for estimating changes in performance (Fig. 3; para 0040, pg. 3; Fig. 5; para 0069, pg.4; para 0076-0077, pg. 5) resulting from modification of the Java application program using information obtained about the garbage collection events ( e.g. *user may then change the value ... user can change the JVM ... desired heap parameters* - para 0041-0049, pg. 3-4); and

wherein the cost of garbage collection to program performance of a modified version of the Java computer application program (e.g. Fig. 2A-B) is estimated by the computer system using a duration of an average garbage collection event and a frequency of occurrence of particular garbage collection events (e.g. *duration* - para 0037, pg. 3; *intervals between* - para 0058-0059, 0063, pg. 4).

**As per claims 13-16**, refer to corresponding rejections as set forth in claims 3, 5-8 respectively.

**As per claim 17**, Coha discloses a computer program product in a computer readable medium for improving performance in a Java computer application program executable by a Java Virtual Machine, comprising the steps of:

first instructions for obtaining information (e.g. Fig. 2A; para 0023-0031, pg. 2) associated with garbage collection;

second instructions for deducing changes (e.g. Fig. 3; para 0040, pg. 3; Fig. 5; para 0069, pg.4; step 250 - Fig. 2B; *accounting for changes, assumptions* - para 0075-0076, pg. 5) in performance that will result from modifying the Java computer application program (e.g. Fig. 2A-B), wherein a cost of garbage collection to program performance of the Java computer

Art Unit: 2193

application program is estimated by the computer program product using a duration of an average garbage collection event and a frequency of occurrence of particular garbage collection events (e.g. *duration* - para 0037, pg. 3; *intervals between* - para 0058-0059, 0063, pg. 4);

wherein the Java computer application program is changed by deducting memory (Fig. 2B- Note: running a instance of GC reads on deducting memory) from a footprint of the Java computer application program.

As per claims 19, 21-23, refer to corresponding rejections as set forth in claims 2-3, 5, 7, 8 respectively.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4, 12, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable under Coha et al., USPubN: 2003/0182597, in view of Sumit Chawla, 'Fine-tuning Java Garbage collection performance', 01 Jan 2003, pp. 1-10; (hereinafter Chawla - url: <http://www.128.ibm.com/developerworks/ibm/library/i-gctroub/> ).

As per claim 4, Coha discloses parameters on heap analysis (timing information - Fig. 2A, 2B; Fig. 4) for a chosen garbage collection execution (e.g. para 0042-0043, pg. 3) hence has disclosed that the duration depends on an amount of garbage that must be cleaned up (e.g. para 0023-0030, pg. 2), an algorithm used to do the collecting or copying, a heap compaction (para 0074-0077, pg. 5 – Note: simulation by using dynamic heap behavior information for improved

collection of unreferenced data reads on selecting algorithmic approach for better compaction or a cost of reconciling object references that are moved.

But Coho does not specify that such duration of garbage collection depends on a number of finalizers that must be executed. The concept of garbage collection being delayed and timely affected by negative impact created by the concurrent *finalizers* processes was a known concept considered by many heap compaction and JVM runtime optimization techniques and this is disclosed in the *verboseGc* -based method by Chawla ( e.g. *allocations inside the finalizers* - pg. 6, avoid *finalizers* - pg. 9). Based on Coho's study to obviate the duration and frequency of garbage collection via repeated simulations ( see Fig. 2, 4, 5; 0023-0030, pg. 2), it would have been obvious for one skill in the art at the time the invention was made, in view of the *verboseGc* tool by Coho, to also put under consideration the negative effects of finalizers execution in a way to obviate their usage -- as taught by the warning by Chawla; because the additional time consumed for the garbage collector to keep track of the un-predetermined memory allocation changes happened inside the *finalizers* by way of their internal operations can affect the attempt to improve resource intent for a concurrent garbage collector as endeavored by Coho (see para 0052-0063, pg. 4); that is, the garbage collection time thereof would be unnecessarily elongated because of the finalizers as put forth in Chawla's recommendation as to avoid *finalizers*.

**As per claims 12 and 20**, refer to the rationale of rejection as set forth in claim 4.

#### ***Response to Arguments***

6. Applicant's arguments filed 10/17/07 have been fully considered but there are no arguments being responsive with the previous grounds of rejection or Examiner's position set

forth in the previous Office Action including the 'Response to Arguments' section. Hence, neither of Applicant's Response has been deemed sufficient to overcome the grounds of rejection.

Accordingly, the claims still stand rejected as set forth in the Office Action.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**Traversal et al**, USPN: 6865657, discloses garbage collection based on interval between garbage collection.

**Chen et al**, "Tuning Garbage Collection in an Embedded Java Environment", discloses compaction of heap objects depending of garbage collection frequency.

8. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (272) 272-3735. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.



Art Unit: 2193

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571)272-3756.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3735 ( for non-official correspondence - please consult Examiner before using) or 571-273-8300 ( for official correspondence) or redirected to customer service at 571-272-3609.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tuan A Vu  
Patent Examiner,  
Art Unit 2193  
December 17, 2007